

Interactive comment on “A large-scale, high-resolution hydrological model parameter dataset for climate change impact assessment for the conterminous United States” by A. A. Oubeidillah et al.

Anonymous Referee #3

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Research efforts presented in the paper focus on the generation of a comprehensive hydrologic model parameter dataset for climate change assessment studies. Various data sets were organized and re-gridded to 4 km grids. The effectiveness of the compiled dataset was tested over the conterminous US using the VIC hydrologic model, where the later was calibrated using USGS provided monthly runoff observations.

Major comments: It is an interesting, well written and structured paper that is easy to follow and understand. Generating and organizing such a detailed dataset of hydrologic

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parameters would certainly be beneficial for the research community; however, there are several major issues that have to be addressed before the paper can be considered for publication: Not clear how the current study relates to previous work done in the area. Authors list several alternative datasets that provide similar information; however, very little is done to demonstrate the advantages of the dataset proposed here over the other alternatives, its accuracy and validity, etc. The manuscript needs more solid discussion, supported with proper references, on what was done previously and how the work proposed here builds on this previous knowledge. Authors have stated in the manuscript that it is hard ‘to fully judge which dataset would be the closest to’ reality (pp. 9582, lines 2-5) and randomly select the DAYMET as a reference, which raises concerns regarding the overall accuracy of the datasets and the validity of the analysis performed here. Proper discussion focused on the quality of the datasets and inter-comparative analysis should be added.

Minor comments: There are nine 4 km grid points within the 12 x 12 km grid. Not certain why the computational time increases to ‘more than 10 times’ when switching from 12 km to 4 km grid (pp 1850, paragraph starting on line 9).

pp. 9580, paragraph describing the meteorological forcing; pp. 9581, paragraph starting on line 4 – believe there is some terminology mixing – all the weather related parameters are measured by specific instruments and are not ‘gauge observations’.

There are several statements made in the paper that are not supported by proper analysis or references: i.e. statement regarding the PRISM product, pp. 9581, lines 7-8, and elsewhere.

Overall the paper reads easily, however there are several grammatical issues that have to be addressed; pp. 9581, line 23: processed in -> processed to; missing definite articles, etc.

pp. 9582, lines 5-6: “for non-US region” – authors clearly state on several occasions very early in the paper that the study area is limited to the conterminous US. Please,

explain.

pp. 9591, lines 12-15: the reviewer assumes that the authors refer to generating and using 'monthly' average LAI values; there might be no annual variability but there is a clear seasonal signal in the LAI times series. Please, clarify.

It is recommended that all the maps included in the manuscript represent the same areal extent, i.e. the conterminous US, and are plotted using the same projection. Also, Fig. 2 has a km scale bar included; Fig. 4 is plotted using a regular lat/long grid frame; Fig. 8 has no geo information. Please, be consistent.

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